

CANDIDATE AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Enhydra lutris kenyoni*

COMMON NAME: southwest Alaska distinct population segment of the Northern sea otter

LEAD REGION: Region 7

INFORMATION CURRENT AS OF: January 2002

STATUS/ACTION (Check all that apply):

☐ New candidate

☒ Continuing candidate

☐ Non-petitioned

☒ Petitioned - Date petition received: 10/25/2000, 1/11/2002

☐ 90-day positive - FR date: \_\_\_\_\_

☐ 12-month warranted but precluded - FR date: \_\_\_\_\_

\_\_\_\_\_ Is the petition requesting a reclassification of a listed species?

☐ Listing priority change

Former LP: \_\_\_\_\_

New LP: \_\_\_\_\_

Latest Date species first became a Candidate: 8/22/2000

\_\_\_\_\_ Candidate removal: Former LP: \_\_\_\_\_ (Check only one reason)

☐ A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

☐ F - Range is no longer a U.S. territory.

☐ M - Taxon mistakenly included in past notice of review.

☐ N - Taxon may not meet the Act's definition of "species."

☐ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Mammals, Mustelidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Alaska

CURRENT STATES/ COUNTIES (optional)/TERRITORIES/COUNTRIES OF  
OCCURRENCE: Alaska

LEAD REGION CONTACT: Rosa Meehan, 907/786-3800

LEAD FIELD OFFICE CONTACT: Marine Mammals Management, Douglas Burn, 907/786-3807

## BIOLOGICAL INFORMATION

Historically, sea otters occurred in nearshore waters around the North Pacific rim from Hokkaido, Japan, through the Kuril Islands, Kamchatka Peninsula, the Commander Islands, the Aleutian Islands, peninsular and south coastal Alaska, and southward to Baja California (Kenyon 1969). The worldwide population of sea otters in the early 1700s has been estimated at 150,000 (Kenyon 1969) to 300,000 (Johnson 1982).

Sea otters occur primarily in shallow, nearshore marine habitats (Rotterman and Simon-Jackson 1988). They eat a wide variety of benthic invertebrates, including clams, mussels, crabs, and sea urchins. Sea otters are also known to eat octopus, squid, and fish. Their dependence on benthic invertebrates greatly influences their distribution; they are seldom found in deep water and/or far from shore. Sea otters seem to prefer areas with kelp beds, but this is not an essential habitat requirement (Riedman and Estes 1990). Although predominantly marine, they will occasionally haul out on shore to rest.

Extensive commercial hunting of sea otters began following the arrival in Alaska of Russian explorers in 1741 and continued during the 18th and 19th centuries. By the time sea otters were afforded protection from commercial harvests by international treaty in 1911, the species was nearly extinct throughout its range, and may have numbered only 1,000 to 2,000 individuals (Kenyon 1969).

The remaining sea otters were distributed as 13 isolated remnant populations scattered throughout the historic range. Taxonomically, three subspecies of sea otter have been identified (Wilson *et al.* 1991). The northern sea otter contains two subspecies: *Enhydra lutris kenyoni*, which occurs from the Aleutian Islands to Oregon, and *Enhydra lutris lutris*, which occurs in the Kuril Islands, Kamchatka Peninsula, and Commander Islands in Russia. The third subspecies, *Enhydra lutris nereis*, occurs in California and is known as the southern sea otter.

Once commercial harvests ceased, these populations began to grow and recolonize their former range. In the Aleutian Islands, two remnant populations existed; one in the Rat Islands and the other in the Delarof Islands. The period of recolonization was marked by high reproductive rates and range expansion. Kenyon's surveys in the 1960's documented sea otters throughout the Rat, Delarof, and Andreanof Islands (Kenyon 1969). The Near Islands to the west, and the Islands of Four Mountains and Fox Islands to the east, had not yet been re-occupied to any great degree. Survey data indicate that otters were present in all island groups in the Aleutians by the 1980s (Brueggeman *et al.* 1988, Estes 1990).

The entire Aleutian Archipelago was not systematically surveyed again until 1992 (Evans *et al.* 1997). The most striking results of this survey were that sea otter density and abundance in the Rat, Delarof, and western Andreanof Islands had unexpectedly declined by more than 50 percent. Boat-based surveys of sea otters at several islands in the Near, Rat, and Andreanof islands further documented an ongoing decline of sea otters during the 1990s (Estes *et al.* 1998).

In April 2000 the U.S. Fish and Wildlife Service, Marine Mammals Management Office, replicated the 1992 aerial survey in the Aleutians. Overall, sea otters in the Aleutian Islands have declined by 70 percent during the 8-year period from 1992 to 2000 (Doroff *et al.* in prep.). The largest declines occurred in the Rat Islands (-87 percent) and the central Aleutians (-71 percent).

It is not clear how many sea otters occupied the Aleutian Islands prior to the onset of commercial exploitation. The maximum post-exploitation population size is also unknown. Calkins and Schneider (1985) calculated the sea otter population in the Aleutians as 55,100 to 73,700 individuals, which represented over half the Alaska population at that time. Based on analysis of aerial and skiff-based surveys collected in 2000, the Service estimates that 8,742 sea otters may remain in the Aleutians.

The April 2000 aerial survey in the Aleutians indicated that sea otters had declined in all major island groups throughout the Archipelago, and therefore, the eastward extent of the decline had not yet been identified. Since that time, the Service has conducted additional aerial surveys along the Alaska Peninsula and the Kodiak Archipelago. Results of these surveys indicate that sea otter populations have declined substantially in these areas as well. Since the last surveys on the Alaska Peninsula conducted in 1986, sea otter numbers have fallen by 36 to 56 percent on the north side and by 91 to 92 percent on the south side. The current population estimate for the Kodiak archipelago is roughly 4,000 less than in 1994; a decline of almost 40 percent in only 7 years.

Population stocks are defined under the Marine Mammal Protection Act (MMPA) as “a group of marine mammals of the same species or smaller taxa in a common spatial arrangement, that interbreed when mature.” The identification of marine mammal stocks is based on analysis of geographic distribution, population response, phenotypic data, and genotypic data. Applying these criteria, Gorbics and Bodkin (2001) identified three stocks of sea otters in Alaska: 1) southwest; 2) southcentral; and 3) southeast. The geographic extent of the decline coincides with the southwest stock, which ranges from Attu Island in the Aleutians through the western shores of Cook Inlet, and includes the Kodiak Archipelago.

The southwest Alaska stock of sea otters is a distinct population segment (DPS) in accordance with the criteria set forth in the Service’s policy regarding distinct vertebrate population segments [61 FR 4722]. The identification of marine mammal stocks under the MMPA illustrates the discreteness of population segments. In the case of the southwest Alaska stock of sea otters, there is both genetic and morphological evidence of separation. The significance of the southwest Alaska DPS of the northern sea otter is evidenced by its vast range, which accounts for more than half of the range within Alaska. In the mid-1980s biologists believed that as much as 80 percent of the world population of sea otters occurred within the range of the southwest Alaska DPS. Recent population surveys indicate that the sea otter populations have undergone precipitous declines in abundance during the past 10-15 years (Doroff *et al.* in press).

On August 22, 2000, the Service designated the northern sea otter in the Aleutian Islands as Candidate Species. The candidate and listing priority form are hereby revised to reflect the most

current scientific information regarding population boundaries and status. The geographic extent of the Candidate Species designation coincides with the range of the southwest Alaska stock, which includes the Aleutian Islands, Alaska Peninsula coast, and Kodiak Archipelago.

## THREATS

Until recently, the Aleutian Islands had been considered a stronghold for sea otters. In the mid-1980s, biologists believed that perhaps half of the world population of sea otters occurred there. When estimates for the Alaska Peninsula are included, it is likely that over 80 percent of the world population of sea otters was concentrated in southwest Alaska only 15 years ago. The dramatic nature of the ongoing population decline is further complicated in that the cause(s) are not clearly known at this time.

### A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

Both natural fluctuations and human activities have caused environmental changes in the Bering Sea. Climate variability occurs at several scales; the El Niño Southern Oscillation, which is a seasonal event; the Pacific Decadal Oscillation, often referred to as a regime shift; and global climate change, which is characterized by long term, progressive change. Interaction between these factors is significant and appears to affect many ecosystem components. Human-induced change is also significant, largely related to resource exploitation of both marine mammals (primarily whales) and fish. As a result, the Bering Sea fish assemblage probably became pollock-dominated in the late 1960s and early 1970s, which may be responsible for decreased abundances of forage fish. Concurrent with these basic changes in ecosystem components are changes in seabird and marine mammal abundances (primarily declines), which likely reflect changes to their primary food resources.

Tissue concentrations of total PCB's and DDT in sea otter liver samples from the Aleutian Islands (primarily from Adak and Shemya) were significantly higher than those of otters from Southeastern Alaska, and total PCB values were higher than those found in California otters (Estes *et al.* 1997, Giger and Trust 1997). Although the toxicity of PCB's in sea otters is unknown, the concentrations in liver of Aleutian otters were similar to or higher than those causing reproductive failure in captive mink (Estes *et al.* 1997, Giger and Trust 1997). Potential sources of these organochlorine compounds include local sources on specific islands and remote sources outside of Alaska, such as industrial and agricultural operations in Asia. Initial population survey data observed typical ratios of mothers and pups, which suggested that reproduction in sea otters is not being suppressed in the Adak Island population (Tinker and Estes 1996). Since PCB's typically inhibit reproduction rather than cause adult mortality, these findings do not suggest a reproductive impact due to contaminants, however sample sizes were limited. Data needed to fully evaluate the potential role of environmental contaminants in the observed Aleutian sea otter decline are incomplete and a conclusive link to specific pollutants has not been established.

### B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Sea otters are harvested by Alaska Natives for subsistence purposes. The majority of the harvest occurs in southeast and southcentral Alaska. Subsistence harvest does not appear to be a contributing factor in the ongoing decline in the southwest Alaska. Scientific research on sea otters occurs primarily as aerial and skiff surveys of abundance. A limited number of otters have been live-captured for health monitoring and radio telemetry studies. The impact of these captures on the sea otter population is not significant.

#### C. Disease or Predation

The causes of the sea otter decline have been explored by reviewing available data on sea otter reproduction, survival, distribution, habitat, and environmental contaminants. Estes *et al.* (1998) concluded that the observed sea otter declines were most likely caused by increased adult mortality. While disease, pollution, and starvation may all influence sea otter mortality, there is no evidence at this time to suggest they are contributing to the decline. Several lines of evidence suggest that predation by killer whales (*Orcinus orca*) may be one of the leading causes of the sea otter decline in the Aleutian Islands (Estes *et al.* 1998). The evidence includes: 1) a significant increase in the number killer whale attacks on sea otters during the 1990s (Hatfield *et al.* 1998); 2) absence of beachcast carcasses; and 3) differential mortality rates between sea otters in a sheltered lagoon (where killer whales cannot go) as compared to an adjacent exposed bay.

#### D. The Inadequacy of Existing Regulatory Mechanisms

The MMPA established a moratorium on the taking of marine mammals, which includes sea otters. Alaska Natives are exempt from this moratorium, and may take marine mammals for subsistence purposes. The MMPA does not allow management prior to a finding of depletion. By definition, a marine mammal species or stock that is designated as “threatened” or “endangered” under the Endangered Species Act is also classified as “depleted” under the MMPA. While the moratorium under the MMPA protects sea otters from take by non-Natives, it does not provide measures to protect habitat for marine mammal species.

#### E. Other Natural or Manmade Factors Affecting its Continued Existence

The hypothesis that killer whale predation is causing the sea otter decline suggests a mechanism that extends further throughout the Bering Sea ecosystem (Estes *et al.* 1998). Harbor seals (*Phoca vitulina*) and Steller sea lions (*Eumetopias jubatus*), preferred prey species of killer whales, have been in decline throughout the western north Pacific. It has been hypothesized that killer whales may have responded by broadening their prey base to include sea otters. While the cause of sea lion and harbor seal declines is the subject of much debate, it is likely that changes in composition and abundance of forage fish as a result of climatic changes and commercial fishing practices are major factors.

BRIEF SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

FOR RECYCLED PETITIONS:

- a. Is listing still warranted? y
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? y
- c. Is a proposal to list the species as threatened or endangered in preparation? y
- d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

## LAND OWNERSHIP

Sea otters occur primarily in Alaska State waters from mean high tide to three miles offshore (the major exception being sea otters located over the broad shelf north of the Alaska Peninsula). Sea otters that occur outside these waters fall within the U.S. Exclusive Economic Zone. Sea otters occasionally haul out on shore. The majority of land in southwest Alaska is part of the National Wildlife Refuge (NWR) system (Alaska Maritime NWR, Izembek NWR, Alaska Peninsula/Becharof NWR, and Kodiak NWR). The National Park Service also owns large parcels in southwest Alaska (Katmai National Park and Aniakchak National Monument and Preserve). The remainder of the coastal lands in southwest Alaska are owned by the State of Alaska and Alaska Native Corporations.

## PRELISTING

Surveys to determine the magnitude and geographic extent have been conducted with the assistance of the U.S. Geological Survey/Division of Biological Resources, the Alaska Sea Otter and Steller Sea Lion Commission, and the World Wildlife Fund. Under Section 119 of the MMPA, the U.S. Fish and Wildlife Service and the Alaska Sea Otter and Steller Sea Lion Commission enter into annual cooperative agreements for the co-management of subsistence use by Alaska Natives. As part of the current cooperative agreement, a genetics study to identify stock boundaries for sea otters in Alaska is ongoing.

## REFERENCES

- Brueggeman, J.J., G.A. Green, R.A. Grotefendt, and D.G. Chapman. 1988. Aerial surveys of sea otters in the northwestern Gulf of Alaska and southeastern Bering Sea. Minerals Management Service and National Oceanic and Atmospheric Administration Final Report. Anchorage, Alaska.
- Calkins, D.G., and K.B. Schneider. 1985. The sea otter (*Enhydra lutris*). Pages 37-45. In: Marine Mammals Species Accounts. J.J. Burns K.J. Frost, and L.F. Lowry (Eds.). Alaska Department of Fish and Game, Technical Bulletin 7.
- Doroff, A.M., J.A. Estes, M.T. Tinker, D.M. Burn, and T.J. Evans. In press. Sea otter declines in the Aleutian Archipelago. Journal of Mammalogy.
- Estes, J.A. 1990. Growth and equilibrium in sea otter populations. Journal of Animal Ecology 59:385-401.

- Estes, J.A., C.E. Bacon, W.M. Jarmin, R.J. Norstrom, R.G. Anthony, and A.K. Miles. 1997. Organochlorines in sea otters and bald eagles from the Aleutian Archipelago. *Marine Pollution Bulletin*, Vol. 34 (6): 486-490.
- Estes, J.A., M.T. Tinker, T.M. Williams, and D.F. Doak. 1998. Killer Whale Predation Linking Oceanic and Nearshore Ecosystems. *Science* 282: 473-476.
- Evans, T.J., D.M. Burn, and A.R. DeGange. 1997. Distribution and Relative Abundance of Sea Otters in the Aleutian Archipelago. U.S. Fish & Wildlife Service, Marine Mammals Management Technical Report MMM 97-5. 29pp.
- Giger, M. and K.A. Trust. 1997. Tissue concentrations of elemental and organochlorine compounds in sea otters from two Aleutian Islands in Alaska. Technical Report WAES-TR-97-01. Ecological Services Anchorage Field Office, Anchorage, AK.
- Gorbics, C.S., and J.L. Bodkin. 2001. Stock structure of sea otters (*Enhydra lutris kenyoni*) in Alaska. *Marine Mammal Science*, 17(3): 632-647.
- Hatfield, B.B., D. Marks, M.T. Tinker, K. Nolan, and J. Peirce. 1998. Attacks on sea otters by killer whales. *Marine Mammal Science* 14(4):888-894.
- Johnson, A.M. 1982. Status of Alaska sea otter populations and developing conflicts with fisheries. *Trans. 47th North American Wildlife and Natural Resources Conference*:293-299.
- Kenyon, K. W. 1969. The Sea Otter in the Eastern Pacific Ocean. United States Department of the Interior. *North American Fauna*, Number 68. 352pp.
- Riedman, M.L., and J.A. Estes. 1990. The sea otter (*Enhydra lutris*): Behavior, Ecology, and Natural History. U.S. Fish and Wildlife Service, Biological Report 90(14). 126pp.
- Rotterman, L.M. and T. Simon-Jackson. 1988. Sea Otter (*Enhydra lutris*). Pages 237-275. *In*: Selected marine mammals of Alaska: Species accounts with research and management recommendations. J.W. Lentfer (Ed.). Marine Mammals Commission, Washington, D.C.
- Tinker, M.T., and J.A. Estes. 1996. The population ecology of sea otters at Adak Island, Alaska. Final Report, December, 1996. Prepared for Mr. Kent Livezey, Wildlife Biologist, Natural Resources Section/Code 231KL. Engineering Field Activity, NW. Naval Facilities Engineering Command. 19917 7<sup>th</sup> Ave. NE, Poulsbo, WA 98370-7570.
- Wilson, D.E., M.A. Bogan, R.L. Brownell, Jr., A.M. Burdin, and M.K. Maminov. 1991. Geographic variation in sea otters, *Enhydra lutris*. *Journal of Mammalogy* 72:22-36.

LISTING PRIORITY (place \* after number)

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3*
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Due to the precipitous and rapid nature of the ongoing population decline, we feel the threat warrants a High priority. A designation of Imminent underscores the urgent need for more information regarding the cause of the decline. Designation of this population as threatened or endangered will enable the Service to direct efforts towards identifying the causes of the decline and develop appropriate strategies for recovery.



APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, removal of candidates, and listing priority changes.

Approve: David B. Allen 4/1/2002  
Regional Director, R7, Fish and Wildlife Service Date

Concur: Steve Williams June 3, 2002  
Director, Fish and Wildlife Service Date

Do not concur: \_\_\_\_\_  
Director, Fish and Wildlife Service Date

Director's Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date of annual review: \_\_\_\_\_  
Conducted by: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_